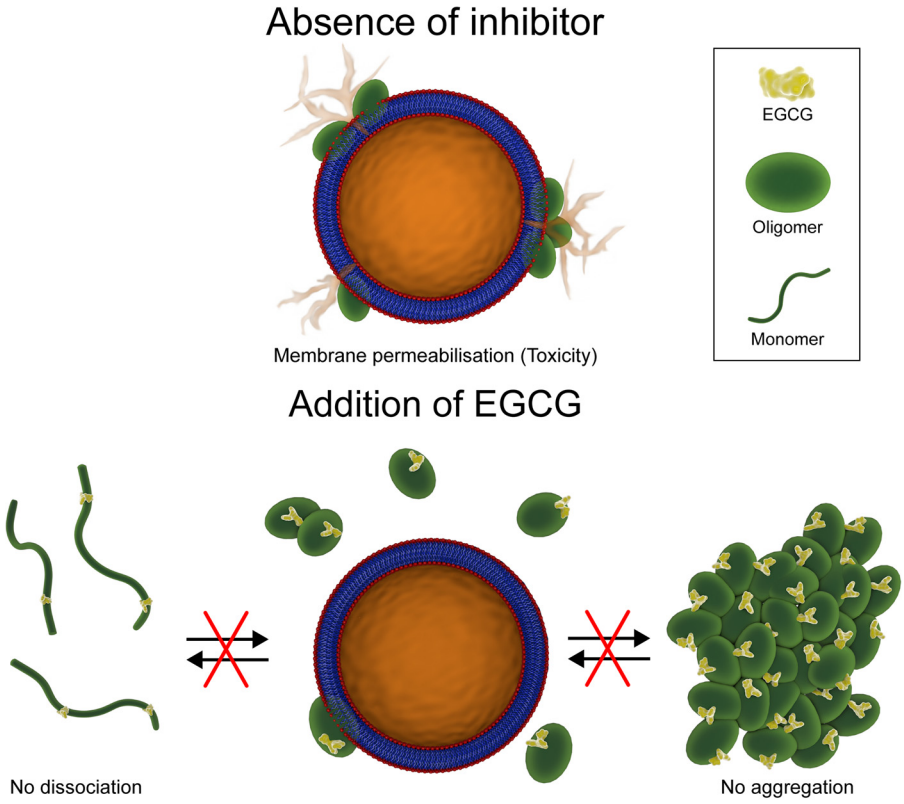
Papers of the Week

Green Tea Flavonoid Prevents α-Synuclein Oligomers from Piercing the Plasma Membrane in Parkinson Disease ♦

♦ See referenced article, *J. Biol. Chem.* 2014, **289,** 21299–21310

How Epigallocatechin Gallate Can Inhibit α-Synuclein Oligomer Toxicity *in Vitro*



Schematic representation of EGCG inhibition of oligomer toxicity. Illustration courtesy of Simon Lykkemark.

In patients with Parkinson disease, the protein α-synuclein (αSN) aggregates to form toxic oligomers. A flavonoid found in green tea called epigallocatechin gallate (EGCG) is known to reduce the toxicity of the oligomers, but the mechanism is not known. In this Paper of the Week, a team led by Daniel E. Otzen at Aarhus University in Denmark used biochemical assays, fluorescence confocal microscopy, NMR spectroscopy, and other approaches to show that EGCG stops oligomers from permeabilizing lipid membranes. They also demonstrated that the molecule prevents the oligomers from causing cytotoxicity in a rat brain cell line. However, EGCG does not affect the size, distribution, or secondary structure of the oligomers; it stiffens the flexible C-terminal ends of the oligomers and decreases the binding of the oligomers to the membranes. The authors conclude, "EGCG inhibits the toxicity of αSN oligomers by decreasing their interaction with membranes, thus highlighting reduction of oligomer-membrane interactions as a viable therapeutic approach against Parkinson disease."

DOI 10.1074/jbc.P114.554667